# *CHAPTER IV*

# *CONCEPTUAL SYSTEMS DESIGN AND ARCHITECTURE FOR THE CRIMINAL JUSTICE INFORMATION SYSTEM*

# CHAPTER IV: CONCEPTUAL SYSTEMS DESIGN AND ARCHITECTURE FOR THE CRIMINAL JUSTICE INFORMATION SYSTEM

One of the major objectives of the project was to assess alternative conceptual systems designs and architectures for the criminal justice information system. This chapter presents a proposed conceptual systems design and architecture for the New Hampshire CJIS.

On the basis of the information gathered during the project, MAXIMUS recommends that the conceptual systems design and architecture for the New Hampshire CJIS should be based on the following core principles.

- The CJIS system should emphasize networking and connectivity rather than the development of a new shared database of criminal justice information.
- The system should take advantage of the current installed base of hardware and software to the extent feasible in order to control costs.
- The network should operate on the State's new telecommunications backbone system which is expected to be in operation by late-1996.
- Pending the implementation of the new backbone system, work should begin as soon as possible on developing interagency agreements, identifying data transmission needs and protocols, developing new software programs, and acquiring hardware necessary to support the new CJIS network.
- The new system should be implemented in phases by module, with the most important modules being implemented first.

In the following sections, we describe each of these aspects of the conceptual systems design in greater detail.

## A. EMPHASIS ON NETWORKING AND CONNECTIVITY RATHER THAN THE DEVELOPMENT OF A NEW SHARED DATABASE

In certain states, CJIS plans have emphasized the need to create a new shared database of criminal justice information to which all appropriate agencies can have access for authorized purposes. These types of databases have been justified on the grounds that

different criminal justice agencies need to have timely access to a single source of information on criminal offenders. Under this approach, each agency is recognized as the source of specific types of data on offenders and cases, and each agency is also granted access to specific types of information.

Although this approach has certain advantages, it also has significant disadvantages, including the following.

- **Concerns About Data Integrity, Data Ownership and Confidentiality:** The development and updating of a new database that exists separately from each agency's own data systems and case records tends to raise concerns about whether the information in the database is accurate and up-to-date. In addition, there is always the risk that the data in the database may be inconsistent and unsynchronized with the data maintained separately by each agency. Agencies also tend to be concerned that they may no longer have control over the integrity and confidentiality of the data that they compile on offenders and cases.
- **Cost Factors:** Creating and maintaining a new independent database has a number of cost implications, especially since new hardware is typically required to maintain the database. In addition to hardware costs, there are significant software development and design costs, as well as personnel costs required for database administration.
- **Time Factors and the System Development Cycle:** The development of a new independent database requires additional time and effort for such tasks as database design and the development of a database dictionary of common data elements.

Rather than developing an independent database, the requirements for the New Hampshire CJIS can be addressed by developing **connectivity** among the courts and the different criminal justice agencies. Under this approach, the courts and the agencies would maintain exclusive control over the information that they generate on offenders and cases, but would also participate in a comprehensive automated network in which specific types of data are transmitted among organizations.

For example, rather than the courts transmitting all of their disposition data to a single central database, a networking strategy would be developed in which individual courts would transmit certain types of disposition data **directly** to specified agencies based on pre-

determined protocols. If a criminal offender, for example, is sentenced by a Superior Court to a term of probation, the network would transmit the appropriate information electronically to the Central Repository, the local arresting agency, the DOC Division of Field Services (both the local District Office and the headquarters office), and the local county attorney. The network would comprise an automatic **"event notification" system** that would also transmit specified items of information to appropriate agencies and the courts about the offender and the case as it is being processed through the system. The specific information to be transmitted will be determined as part of a detailed Functional requirements Analysis and initial design activities during the implementation of the Master Plan. The information to be transmitted might also automatically update the databases of the recipient agencies.

The concept of the CJIS network as an event notification system differs from the traditional "offender-based tracking system" (OBTS) concept based on a new independent database. Under the event notification concept, it is assumed that the information needs of different agencies are focused primarily on the outcomes of specific case actions, including arrest, prosecution, adjudication, and correctional supervision. In contrast, the OBTS concept is based on the assumption that agencies are primarily concerned with being able to make ad hoc inquiries about specific offenders and their status.

It should be noted, however, that the proposed CJIS network would provide an **offender-based inquiry and tracking capability** as well as an event notification system. First, the network would allow agencies to query the databases of other criminal justice agencies and the courts to obtain needed information on an ad hoc basis. For example, county attorneys and local arresting agencies would have the capacity to query the SUSTAIN systems of individual courts to obtain information about the status of criminal cases. They would also have the capacity to copy data from SUSTAIN into their own systems. Second, if agencies wish to obtain accurate information about specific offenders, they will have access to a more comprehensive and up-to-date criminal history records database (CHRI) than exists currently. Specifically, the proposed network will improve the overall quality and completeness of the arrest data and disposition data in the CHRI, especially if local arresting agencies are required to submit fingerprint cards to the Central Repository on all persons arrested. This will minimize the need to make inquiries of several different agencies to

obtain data on individual offenders. If an agency is unable to obtain information from the improved CHRI database, it could query the DMV database. Together, these two data sources should provide agencies with almost all of the available information on specific offenders and their status. Finally, agencies will be able to query the DOC databases to obtain up-to-date information on the supervision status of offenders sentenced to incarceration or probation.

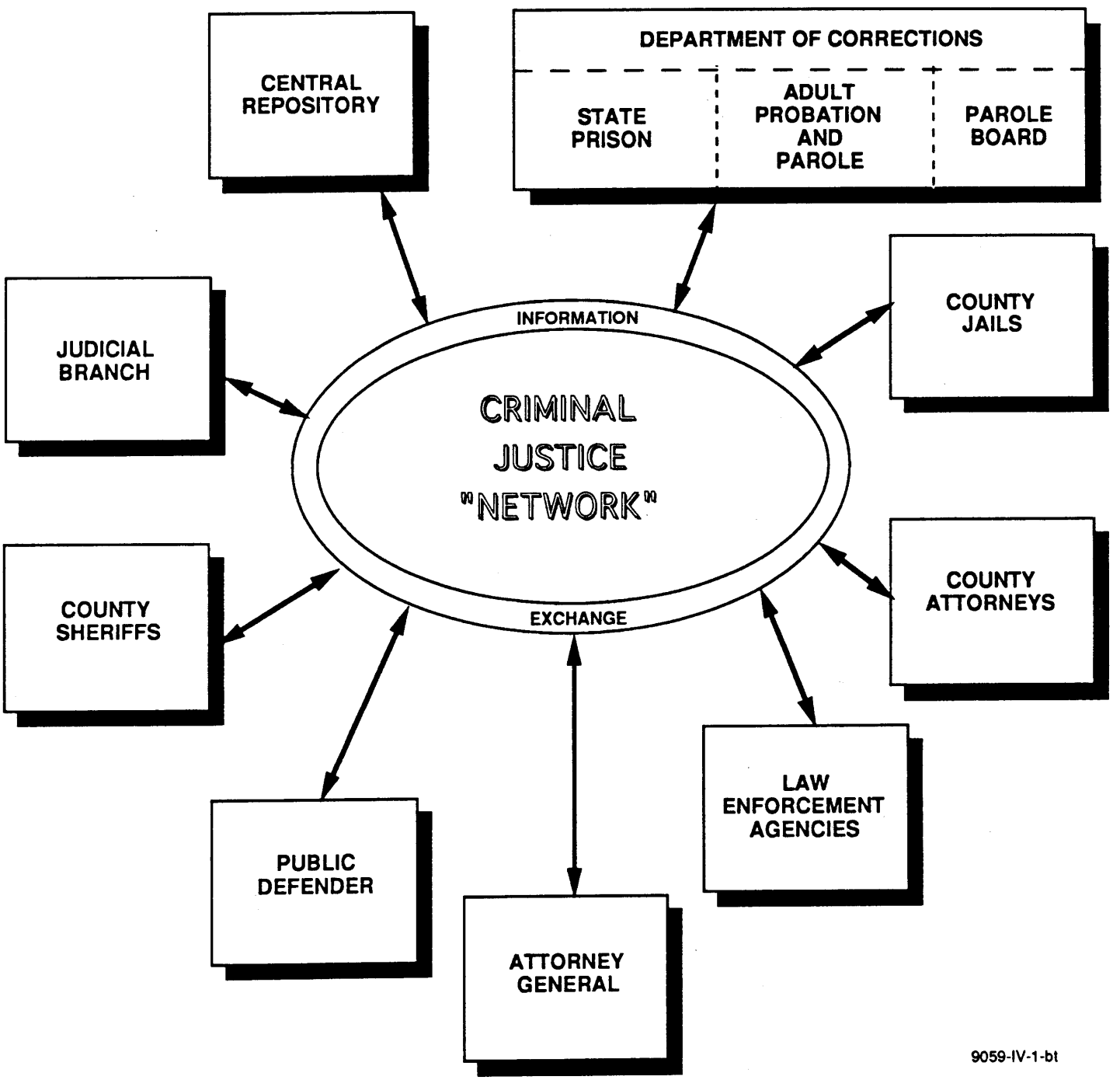
Exhibit IV-1 depicts the conceptual systems design for the New Hampshire CJIS, based on the proposed networking concept. When the backbone system is fully operational, the individual agencies and courts will be able to communicate with each other through the network. For example, individual courts could transmit data directly to the Central Repository, other courts, local County Attorneys, and local arresting agencies. Similarly, individual agencies would have the capacity to query the data of specific agencies or individual courts, subject to pre-defined authorization protocols.

Exhibit IV-2 illustrates the overall types of data that would be exchanged through the proposed network.

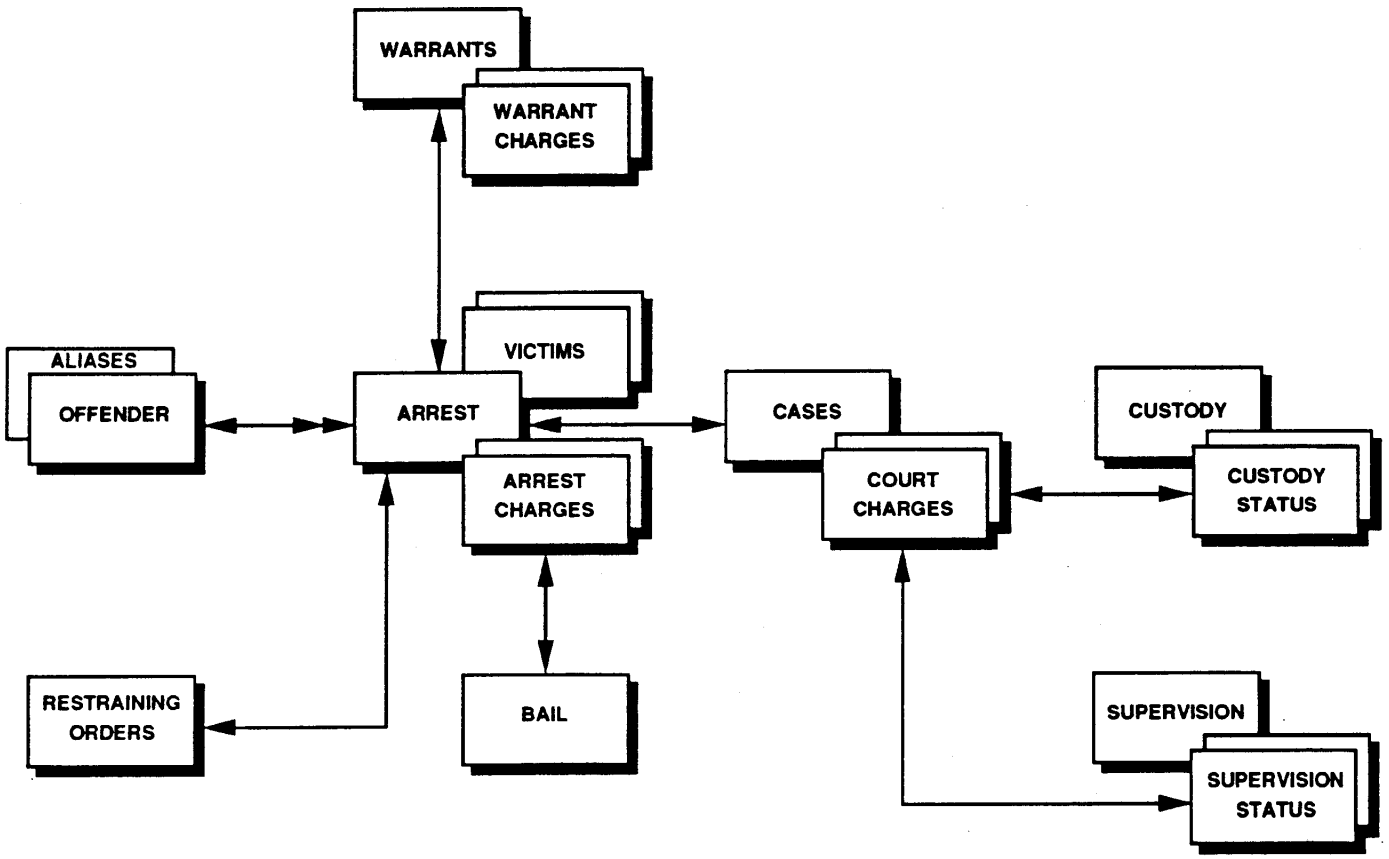
## B. NEED TO BUILD UPON THE CURRENT INSTALLED BASE OF HARDWARE AND SOFTWARE

In order to contain costs for the development and operation of the New Hampshire CJIS, it is important that the new network be built upon the installed base of hardware and software to the extent feasible. At the current time, the judicial branch and many state and local criminal justice agencies have already acquired extensive computer hardware and software or are in the process of designing and implementing new systems. In some cases, it will be practical to build on this installed base, but a number of individual agencies are not

## Exhibit IV-1
## CONCEPTUAL SYSTEMS DESIGN FOR THE NEW HAMPSHIRE CJIS



## Exhibit IV-2
## CJIS DESIGN: DATA RELATIONSHIPS

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satisfied with their current systems and will be replacing them during the next few years. In replacing their systems, these agencies should be encouraged to plan their new systems with a view to the proposed emphasis on connectivity with the courts and other agencies. There are also agencies (including many local police departments, several County Attorney's offices, and some county jails) which have minimal automation and would have to acquire new hardware and software in order to participate fully in the new network.

In the sections below, we present a brief assessment of the current state of automation of the courts and major criminal justice agencies in terms of their capacity to interface with a CJIS network.

## 1. CENTRAL REPOSITORY

The Central Repository's automated criminal history record information (CHRI) database resides on the Repository's own BULL mini-computer. Staff at the Repository have a total of eight terminals linked to the BULL computer. The system operates on the UNIX operating system and uses the ORACLE database management software.

Based on the functional requirements analysis presented in the previous chapter, the Central Repository would experience a significant increase in the volume of incoming automated data transmissions or transfers, especially from the individual courts (dispositions and warrants) and local arresting agencies (arrests and criminal incidents). The current BULL mini-computer, however, should have sufficient capacity to receive and process the new information. Additional resources will be required to develop the applications programming required to accept the new data transmissions.

## 2. LOCAL LAW ENFORCEMENT AGENCIES

With regard to the reporting of arrest data and criminal incident data, efforts are currently underway to convert local police departments to PC environments as needed. About one-half of local police departments currently have PCs and the remaining departments will have PCs within one year. This will facilitate the on-line reporting of arrest data, but PCs will also have to be provided to all booking stations as well as local police departments.

## 3. THE COURTS

As noted in the Phase I Report, the AOC is currently overseeing the statewide implementation of the SUSTAIN system in the District and Superior Courts. All of the 40 District Courts have already implemented this system. In addition, six of the Superior Courts have implemented SUSTAIN. The seven Superior Courts that have not yet implemented SUSTAIN will be implementing the system within the next two years, and their current hardware and software will be replaced with PC-based LAN systems. Each of the 40 District Courts has a PC-based LAN, with Novell Netware and WordPerfect 5.1. The PC LANS are not tied together.

### 3.1 Use of SUSTAIN in the CJIS Network

The SUSTAIN system currently contains all of the basic information that would be transmitted to different criminal justice agencies under the functional requirements defined in the previous chapter. A case is currently established on SUSTAIN on the basis of the hard copy Complaint received from arresting agencies or prosecutors. The system is then updated through other source documents and information, such as scheduled hearings, results of trials, guilty pleas, and other events.

There are three aspects of the SUSTAIN system, however, that have implications for tying the system to a CJIS network. First, the system does not provide any automated interfaces among the different District Courts, although the AOC is in the process of implementing a Wide Area Network (WAN) on a pilot basis. Under this pilot, two of the District Courts (Pittsfield and Concord) will be linked to AOC through the WAN. The WAN will involve dedicated telephone lines and three routers, in contrast to the current dial-up system. The WAN, however, will be used **for sharing case management information.** The Superior Courts are also interested in a WAN network, but primarily to allow judges to communicate with each other.

Second, the SUSTAIN system does not currently provide an automated interface between the District Courts and the Superior Courts, except that appeals from the District Courts to the Superior Courts can be recorded in the SUSTAIN systems of the respective

courts. If a case is appealed from a District Court to a Superior Court, however, the case information has to be transferred manually.

Third, there is currently no automated interface between the individual courts and the AOC, except for a dial-up system that AOC uses for DP support. The AOC handles all of the DP support for each of the courts, including diagnosing problems and emergency fixes.

### 3.2 Implications for the CJIS Network

Because of these features of SUSTAIN, it would appear that the most feasible architecture for the transmittal of case information from the courts to the criminal justice agencies would involve having the individual courts transmit their own data directly to these agencies. An individual court, for example, would transmit disposition data on its cases directly to the Central Repository, the local County Attorney, the arresting agency, and the Department of Corrections, rather than sending this information through a centralized point at the AOC or another location. This proposed architecture, however, might be modified if the Judicial Branch chooses at some time to implement its own central "hub" system linking all of the courts.

## 4. ATTORNEY GENERAL'S OFFICE

The Attorney General's Office currently has a Wang VS-7120 mid-size computer located at its main office in Concord. A number of PCs, dumb terminals and printers are connected to the Wang.

### 4.1 Automation Plans

The AG's Office is dissatisfied with its current system for a number of reasons, including:

- the lack of networking and interfaces with other state agencies and other facilities of the AG's office,
- the system's very limited management reporting capability, and
- the limited functionality of the home-grown software.

The current automated system is used to capture basic data on the defendant, the venue of the criminal proceedings, the opposing counsel, a brief narrative on the offense, and data on the investigation, prosecution, disposition, and sentencing. The system also includes a tracking component to ensure that court appearances are made.

The AG's Office has appointed a Senior Management Committee to develop a Strategic Plan for Information Technology. The focus of the plan will be to develop a variety of networks within the AG's headquarters building and with other AG facilities and to promote communications with the AG's client agencies and opposing counsel. The headquarters building has already been wired for this purpose. OITM will be assigning a staff person to address the automation needs of the AG's Office. The AG's Office has put in a capital budget request to replace the Wang with new equipment.

### 4.2 CJIS Implications

As the AG's Office replaces its current hardware and software, there will be a need to consider connectivity with other agencies and the Judicial Branch, based on the functional requirements presented in Chapter III. The primary interfaces will involve receiving data from individual courts on case scheduling and dispositions. Networking with individual courts, therefore, would be a primary focus of future telecommunications plans.

## 5. COUNTY ATTORNEYS AND PUBLIC DEFENDERS

The four largest County Attorney offices (Hillsborough, Rockingham, Merrimack and Strafford) have implemented automated case management systems, but these are standalone systems unconnected with the local courts or other criminal justice agencies. According to the AG's Office, most of the other County Attorneys are 2-3 person operations and may have only word processing.

Based on the preliminary functional requirements analysis, the County Attorneys and Public Defenders will interface primarily with the local courts within their jurisdictions, focusing on case scheduling and the transmittal of disposition and charging information. Accordingly, the primary focus of initial CJIS development efforts should be to establish

connectivity within each county between the local courts, the County Attorney's office, and the Public Defender. In the larger counties where the County Attorneys have already implemented automated case management systems, this could be accomplished by developing linkages between these systems and the SUSTAIN system at individual courts. This would require the development of the necessary software and the hardware required to establish the link (such as modems and data lines). Some County Attorney's offices, however, are either not automated or are hoping to upgrade their current systems (such as the Merrimack County Attorneys Office). In such offices, it is will be necessary for the County Attorneys to automate or complete their upgrades before being able to connect to local court systems. This would involve hardware and software acquisition.

## 6. DEPARTMENT OF CORRECTIONS

The requirements for linking the Department of Corrections to the proposed CJIS network are reviewed below.

### 6.1 Current Automation Plans

The Department of Corrections is in the process of implementing an automated system to process and store information on offenders sentenced to the State Prison. The new system will automate the Offender Records Office at the prison and will cover such information as sentences, offender information, jurisdiction, admission date and a large array of other information. The system will also compute release dates and provide a variety of management reporting options.

The system will be installed on the DOC's newly acquired BULL mid-size computer and will operate on IBM's AIX operating system (which is IBM's version of UNIX). The computer has already been purchased and is situated at the State Prison. The system will use the INFORMIX relational database management system. The applications software will be a customized version of a commercial jail management system package. The functions of the "offender records" component of this software will include sentence management and "event" data, such as classification changes. The system will also capture or compute information on

the demographics and physical characteristics of inmates, sentence dates, sentence length, good time earned, disciplinary days, minimum sentence before parole, and other variables. The system will include an automated tickler to notify DOC officials of upcoming release dates and parole hearings. Under the new system, each offender will be given a permanent ID number and a booking ID number.

### 6.2 Limitations of the Proposed DOC System for CJIS Networking

One of the major limitations of DOC's proposed new system is that it will cover only inmates at the State Prison, and does not include modules to track persons while on probation or parole (However, it is hoped that data on parolees will eventually be merged with the new system). When the new system was originally being planned, DOC was intending to include the Division of Field Services in the system. However, the projected costs for the fully integrated system were in excess of funds available, so the plan had to be amended to exclude the Division of Field Services.

The Division of Field Services has its own automated system that runs on the BULL computer housed at the Department of Health and Human Services. The data is keyed in at the District Offices. The system contains basic case information on each offender. The District Offices have PCs which are hooked up to the BULL through land line communications. The Division pays a monthly fee to HHS for use of the computer. Clerical staff at the District Offices use the PCs to enter new cases and to update the cases based on such events as violations and transfers. The District Offices also have an inquiry capability and E-mail.

The Division is dissatisfied with its current automated system with regard to the applications software and the hardware configuration. The Division has requested a $2.7 million capital improvement budget for the 1995-96 biennium, but is not sure how much money will actually be appropriated. Future CJIS development plans will have to take account of the system enhancement initiatives of the DOC with respect to the Division of Field Services.

### 6.3 Requirements for DOC Participation in the CJIS Network

The transmittal of disposition data from the courts to the Department of Corrections is one of the primary interfaces identified in the preliminary functional requirements analysis for the CJIS system. This includes (1) the transmittal of disposition data to the State Prison (incarcerations) and (2) the transmittal of data to the District Offices of the Division of Field Services (probation sentences). To support these interfaces, it will be necessary to develop telecommunications linkages between individual courts and the State Prison, and between individual courts and the Division of Field Services District Offices. Alternative system architectures for achieving these linkages must be evaluated.

Electronic linkages must also be developed between the State Prison and the County Attorney's offices to notify victim-witness coordinators of upcoming parole hearings and releases. Finally, some type of telecommunications linkage must be developed to allow the Division of Field Services to notify local law enforcement agencies of persons currently on probation or parole statewide. One option for implementing this interface on an interim basis would be to have the Division of Field Services transmit the information through the Central Repository for statewide dissemination through SPOTS.

## 7. COUNTY SHERIFFS AND COUNTY JAILS

The 10 county sheriffs in New Hampshire have varying levels of automation. With regard to the county jails, a total of five of the jails are known to be automated, and plans are underway to automate the remaining jails in the near future. As noted in the preliminary functional requirements analysis, the primary CJIS interfaces that will involve the sheriffs departments and county jails include the following:

- transmittal of disposition information from the individual courts to the sheriffs and the jails;
- transmittal of arrest orders from the Superior Courts to the sheriffs; and
- transmittal of prisoner transportation information among the courts, the sheriffs, and county jails.

In terms of system architecture, these interfaces could be handled primarily through local linkages among the individual courts, sheriffs departments and jails at the county level. In order to take advantage of the state's new backbone system, these linkages would have to based on connections with local system nodes.

## C. USE OF THE STATE'S TELECOMMUNICATIONS BACKBONE SYSTEM

As noted, the optimal way to develop an integrated criminal justice information system (in terms of both efficiency and cost) will be to use the backbone telecommunications system currently being planned by the Office of Information Technology Management (OITM). DAS/OITM is in the process of developing an RFP for the new telecommunications system for use by state agencies. The new system will replace the existing leased line systems used by state agencies. It is anticipated that the new project will begin in late 1995 and that the backbone system will be operational by late-1996.

Although the new network is currently being planned for state agencies, the courts will be involved even though they are not part of the Executive Branch. The AOC wishes to use the new network as a pipeline for connecting the individual courts, but there are currently no plans on the part of AOC to use the network to share data with criminal justice agencies.

It is anticipated that, when the backbone system is implemented, there may be about 20 local nodes statewide for all agencies. These nodes might be established in such locations as the district offices of the Department of Health and Human Services or other state agencies. A Committee is about to be established to determine the future level of demand for each agency.

With regard to the courts, the Superior Courts and the District Courts might tap into the local nodes. It would be necessary to acquire modems to link the individual courts with the local nodes. Connections to the nodes would be through leased lines. This would help address the fact that the courts do not have a network of their own. Under this scenario, if a local court wished to link to another local court, the data would be transmitted directly between the individual courts.

The DOC, DOS, and state police troops will be included in the network as state agencies. The existing system maintained by the DOC Division of Field Services would be replaced by the new network. The most logical next step for DOC would be to integrate the probation/parole system into their new UNIX-based system that will operate at the State Prison.

The Wang equipment at the Attorney General's Office will be replaced. OITM has asked the AG's Office to develop a Business Plan for future systems development. The AG's planning committee, however, has not yet addressed CJIS issues in their current planning process.

With regard to local agencies, county attorneys and local police departments are not regarded as state agencies for purposes of the new network. If they were to be linked to the network through a dial-up to the nodes, it would be necessary to develop an arrangement for covering the necessary costs. The potential capacity of the new network is not a major issue with regard to adding new users.

With regard to DP standards for state agencies, OITM has put together a set of high-level principles which all of the agencies have accepted. Recommendations about hardware/software standards will be made as the project progresses. OITM is responsible for setting the standards, based on recommendations from an interagency committee. Working committees will develop standards for each major area, such as PCs and word processing software. For network operating systems, the state standard will be Novell Netware.

The current BULL mainframe at HHS (which is used by the DOC Division of Field Services) will be phased out. No standards have yet been developed for database management systems (except that they must be SQL-compliant) or for PC capacity.

DAS/OITM is planning to outsource the maintenance of the software for the network. Under the outsourcing approach, the vendor would provide programmers for software maintenance. The operation of the network, however, would not necessarily be outsourced. Under one scenario, a contractor might build and maintain the network, but the state would operate the network.

## D. PHASED IMPLEMENTATION OF THE SYSTEM

To allow New Hampshire to take advantage of the CJIS system as soon as possible, the most important modules should be designed and implemented first, while the lower-priority modules will be implemented later. This approach is discussed in greater detail in Chapter VI.